

TABLE 1.—Averages, departures, and extremes of atmospheric pressure at sea level at indicated hours, North Pacific Ocean, January, 1928

Stations	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	<i>Inches</i>	<i>Inch</i>	<i>Inches</i>		<i>Inches</i>	
Dutch Harbor <sup>1</sup> .....	29.35	-0.29	29.86	26th.....	28.18	6th.
St. Paul <sup>1</sup> .....	29.37	-0.32	29.82	25th.....	28.90	13th. <sup>2</sup>
Kodiak <sup>1</sup> .....	29.45	-0.19	30.10	1st.....	28.40	7th. <sup>2</sup>
Midway Island <sup>1</sup> .....	30.09	+0.09	30.40	11th.....	29.80	8th. <sup>2</sup>
Honolulu <sup>1</sup> .....	30.09	+0.09	30.21	22d.....	29.89	1st.
Juneau <sup>1</sup> .....	29.84	-0.04	30.46	18th.....	28.78	7th.
Tatoosh Island <sup>1</sup> .....	30.10	+0.16	30.44	26th.....	29.67	21st.
San Francisco <sup>1</sup> .....	30.23	+0.14	30.45	7th.....	29.90	14th.
San Diego <sup>1</sup> .....	30.13	+0.07	30.31	17th.....	29.79	14th.

<sup>1</sup> P. m. observations only.<sup>2</sup> For 30 days.<sup>3</sup> A. m. and p. m. observations.<sup>4</sup> Corrected to 24-hour mean.<sup>5</sup> And other dates.

January, however, was less stormy than either of the two preceding months. Yet moderate to strong gales were experienced over most of the upper two-thirds of the ocean during the first few days, though they did not attain to hurricane force except on the 3d, between 40° N., 150° E., and the upper Japanese coast. After the 7th, although moderate scattered gales continued, there was a general diminution of high windiness until after mid month, then a gradual increase over large sections of the ocean, the maximum known wind of this latter

period being of force 11 near 46° N., 164° E., on the 21st. Local gales of forces 8 and 9 occurred during the last five days of the month in connection with the cyclone which hung off the California coast. This disturbance, the most peculiar of the month, moved about in all directions, expanding and contracting, while hemmed in by anticyclones except on its northwestern quadrant, where it connected with the northern Low.

At Honolulu the prevailing wind direction continued from the east, average velocity, 10.5 miles, maximum velocity, 31 miles, from the east.

This January was reported as one of the warmest on record off the coast of southeastern Alaska.

Northers were exceptionally frequent and severe in the Gulf of Tehuantepec. Gales equaling or exceeding force 8 occurred on about 30 per cent of the days, attaining force 10 on four occasions. The winds thence down the Central American coast were also unusually strong, reaching force 7 on several days.

Fog was of very slight occurrence over by far the greater area of the ocean, except adjacent to the American coast. Nine days with fog were reported off Lower California, and it was observed on 14 days between the thirtieth and fortieth parallels, from the coast to longitude 132° W. Some 20 per cent of fog formed along the coastwise routes between latitudes 40° and 50° N., with slightly the greatest frequency experienced about Vancouver Island.

## CLIMATOLOGICAL TABLES

### DESCRIPTION OF TABLES AND CHARTS

Table 1 gives the data ordinarily needed for climatological studies for about 176 Weather Bureau stations making simultaneous observations at 8 a. m. and 8 p. m. daily, seventy-fifth meridian time, and for about 37 others making only one observation. The altitudes of the instruments above ground are also given.

Beginning January 1, 1928, movement and velocity of the wind are printed as recorded by the three-cup anemometer replacing the four-cup pattern.

Table 2 gives, for about 35 stations of the Canadian Meteorological Service, the means of pressure and temperature, total precipitation, depth of snowfall and the respective departures from normal values except in the case of snowfall. The sea-level pressures have been computed according to the method described by Prof. F. H. Bigelow in the REVIEW of January, 1902, 30:13-16.

CHART I.—*Temperature departures*.—This chart presents the departures of the monthly mean surface temperatures from the monthly normals. The shaded portions of the chart indicate areas of positive departures and unshaded portions indicate areas of negative departures. Generalized lines connect places having approximately equal departures of like sign. This chart of monthly surface temperature departures in the United States was first published in the MONTHLY WEATHER REVIEW for July, 1909, but smaller charts appear in W. B. Bulletin U from 1873 to June, 1909, inclusive.

CHART II.—*Tracks of centers of ANTICYCLONES*; and

CHART III.—*Tracks of centers of CYCLONES*. The Roman numerals show the chronological order of the centers. The figures within the circles show the days of the month; the letters *a* and *p* indicate, respectively, the observations at 8 a. m. and 8 p. m., seventy-fifth meridian time. Within each circle is also given (Chart II), the last three figures of the highest barometric reading, or (Chart III) the lowest reading reported at or

near the center at that time, and in both cases as reduced to sea level and standard gravity. The inset map of Chart II shows the departure of monthly mean pressure from normal and the inset of Chart III shows the change in mean pressure from the preceding month.

CHART IV.—*Percentage of clear sky between sunrise and sunset*.—The average cloudiness at each Weather Bureau station is determined by numerous personal observations between sunrise and sunset. The difference between the observed cloudiness and 100 is assumed to represent the percentage of clear sky, and the values thus obtained are the basis of this chart. The chart does not relate to the nighttime.

CHART V.—*Total precipitation*.—The scales of shading with appropriate lines show the distribution of the monthly precipitation. The inset on this chart shows the departure of the monthly totals from the corresponding normals.

CHART VI.—*Isobars at sea level, average surface temperatures, and prevailing wind directions*.—The pressures have been reduced to sea-level and standard gravity by the method described by Prof. Frank H. Bigelow in the REVIEW for January, 1902, 30:13-16. The pressures have also been reduced to the mean of the 24 hours by the application of a suitable correction to the mean of 8 a. m. and 8 p. m. readings at stations taking two observations daily, and to the 8 a. m. or the 8 p. m. observation, respectively, at stations taking but a single observation. The diurnal corrections so applied will be found in the Annual Report of the Chief of the Weather Bureau, 1900-1901, volume 2, Table 27, pages 140-164.

The sea-level temperatures are now omitted and average surface temperatures substituted. The isotherms can not be drawn in such detail as might be desired, for data from only the regular Weather Bureau stations are used.

The prevailing wind directions are determined from hourly observations at the great majority of the stations.

A few stations determine their prevailing directions from the daily or twice-daily observations only.

**CHART VII.—Total snowfall.**—This is based on the reports from regular and cooperative observers and shows the depth in inches of the snowfall during the month. In general, the depth is shown by lines inclosing areas of equal snowfall, but in special cases figures also are given.

This chart is published only when the snowfall is sufficiently extensive to justify its preparation. The inset of this chart, when included, shows the depth of snow on the ground at the end of the month.

**CHARTS VIII, IX, etc.—North Atlantic Weather maps of particular days.**

## CONDENSED CLIMATOLOGICAL SUMMARY

In the following table are given for the various sections of the climatological service of the Weather Bureau the monthly average temperature and total rainfall; the stations reporting the highest and lowest temperatures, with dates of occurrence; the stations reporting the greatest and least total precipitation; and other data as indicated by the several headings.

The mean temperature for each section, the highest and lowest temperatures, the average precipitation, and the greatest and least monthly amounts are found by using all trustworthy records available.

The mean departures from normal temperatures and precipitation are based only on records from stations that have 10 or more years of observations. Of course, the number of such records is smaller than the total number of stations.

*Condensed climatological summary of temperature and precipitation, by sections, January, 1928*

Section	Temperature								Precipitation					
	Section average	Departure from the normal	Monthly extremes						Section average	Departure from the normal	Greatest monthly		Least monthly	
			Station	Highest	Date	Station	Lowest	Date			Station	Amount	Station	Amount
	°F.	°F.		°F.			°F.		In.	In.		In.		In.
Alabama.....	44.9	-1.0	Eufaula.....	81	16	Valley Head.....	-2	2	1.56	-3.50	Maple Grove.....	3.34	Alaga.....	0.25
Arizona.....	45.4	+1.7	3 stations.....	83	16	2 stations.....	-7	17	0.13	-1.06	Childs.....	1.50	49 stations.....	0.00
Arkansas.....	42.7	+1.6	Dumas.....	90	11	Lead Hill.....	-10	3	2.05	-2.05	Higden.....	4.60	Whitecliffs.....	0.50
California.....	46.3	+1.0	2 stations.....	92	12	Helm Creek.....	-24	18	1.84	-3.60	Cummings.....	12.59	10 stations.....	0.00
Colorado.....	28.4	+4.4	Lamar.....	82	14	Sunbeam.....	-34	1	0.27	-0.73	Steamboat Springs.....	1.53	15 stations.....	0.00
Florida.....	56.0	-2.7	2 stations.....	87	16	4 stations.....	15	12	0.75	-2.02	Blountstown.....	1.73	Everglades.....	0.02
Georgia.....	46.0	-0.6	2 stations.....	83	15	Blue Ridge.....	-5	2	1.46	-2.78	Cornelia.....	3.38	Waycross.....	0.36
Idaho.....	25.9	+1.8	4 stations.....	57	15	Stanley.....	-29	17	1.90	-0.19	Avery.....	5.77	Dubois.....	T.
Illinois.....	29.1	+2.3	Harrisburg.....	74	16	2 stations.....	-19	2	1.08	-1.18	Danville.....	2.69	Astoria.....	0.05
Indiana.....	29.0	+0.4	2 stations.....	73	16	2 stations.....	-15	2	1.74	-1.31	Butlerville.....	2.86	Whiting.....	0.45
Iowa.....	25.2	+0.6	Little Sioux.....	70	10	2 stations.....	-20	2	0.17	-0.90	Olin.....	1.04	10 stations.....	T.
Kansas.....	34.7	+4.9	6 stations.....	80	14	Burr Oak.....	-22	3	0.09	-0.57	Toronto.....	0.59	9 stations.....	0.00
Kentucky.....	35.0	-0.5	Williamsburg.....	76	15	Junction City.....	-8	2	2.47	-1.91	Jenkins.....	4.24	Ravenna.....	0.90
Louisiana.....	50.6	-0.6	2 stations.....	85	11	Plain Dealing.....	9	2	1.03	-3.70	Paradis.....	2.87	Newlano.....	0.00
Maryland-Delaware.....	34.3	+1.7	2 stations.....	72	15	2 stations.....	-11	30	2.52	-0.85	Maryland Line, Md.....	4.65	Hancock, Md.....	0.71
Michigan.....	23.0	+3.1	Eau Claire.....	60	15	Humboldt.....	-32	30	1.83	+0.03	Calumet.....	6.56	Kent City.....	0.42
Minnesota.....	12.9	+4.6	Winona.....	51	6	2 stations.....	-39	2	0.36	-0.38	Farmington.....	1.15	Willmar.....	0.05
Mississippi.....	46.7	-0.2	Rosedale.....	83	11	3 stations.....	3	3	1.72	-3.42	Grenada.....	3.49	Columbia.....	0.61
Missouri.....	33.3	+2.9	Poplar Bluff.....	77	11	Louisiana.....	-18	2	0.87	-1.16	Doniphan.....	2.26	8 stations.....	T.
Montana.....	22.3	+3.9	Winifred.....	64	12	Big Sandy.....	-48	1	0.98	+0.24	Hebgen Dam.....	3.39	Savage.....	0.00
Nebraska.....	29.1	+7.2	Culbertson.....	73	13	Gordon.....	-26	1	0.16	-0.39	Hay Springs.....	0.80	Ericson.....	0.00
Nevada.....	32.0	+2.0	Beatty.....	73	12	Millet.....	-16	18	0.38	-0.61	Tuscarora.....	1.21	3 stations.....	0.00
New England.....	24.4	+2.0	2 stations.....	58	1	Pittsburg (a), N. H.....	-37	16	2.74	-0.67	Somerset, Vt.....	4.81	Waterbury, Conn.....	1.02
New Jersey.....	32.5	+2.6	3 stations.....	65	15	Layton.....	-15	30	2.26	-1.35	Chatham.....	3.97	Sandy Hook.....	1.37
New Mexico.....	35.8	+2.1	2 stations.....	82	11	Dulce.....	-18	1	0.02	-0.50	Red River Canyon.....	0.35	112 stations.....	0.00
New York.....														
North Carolina.....	41.0	-0.6	Goldsboro.....	85	16	Banners Elk.....	-13	2	1.57	-2.33	Parker.....	5.06	Manteo.....	0.22
North Dakota.....	13.0	+8.1	2 stations.....	50	11	2 stations.....	-41	11	0.21	-0.33	Cando.....	1.04	2 stations.....	0.00
Ohio.....	29.1	+0.9	2 stations.....	71	14	2 stations.....	-10	3	1.70	-1.31	Bangorville.....	2.88	Catawba Island.....	0.87
Oklahoma.....	41.4	+3.1	Hollis.....	85	14	Boise City.....	-8	1	0.95	-0.53	McAllester.....	3.32	2 stations.....	0.00
Oregon.....	34.8	+0.7	McMinnville.....	69	11	La Grande.....	-8	1	4.07	-0.65	Valsetz.....	17.74	Andrews.....	0.28
Pennsylvania.....	29.8	+2.0	3 stations.....	65	18	Goldsboro.....	-23	30	2.08	-1.25	York Haven.....	4.48	2 stations.....	0.73
South Carolina.....	44.7	-0.8	Summerville.....	81	17	Caesar's Head.....	0	2	1.48	-2.06	Walhalla.....	3.20	Rimini.....	0.10
South Dakota.....	20.8	+4.9	Hermosa.....	70	10	Camp Crook.....	-37	1	0.21	-0.39	Hardy Ranger Station.....	1.50	3 stations.....	0.00
Tennessee.....	38.6	-0.1	Lynnville.....	77	16	4 stations.....	-10	2	2.90	-1.84	Cedar Hill.....	4.53	Buffalo Valley.....	0.90
Texas.....	48.7	+0.2	Fort Stockton.....	93	15	Dalhart.....	-7	1	0.67	-1.16	Enclinal.....	3.40	18 stations.....	0.00
Utah.....	27.6	+2.3	2 stations.....	68	13	Castle Rock.....	-16	19	0.42	-0.92	Silver Lake.....	1.31	4 stations.....	0.00
Virginia.....	37.4	+1.8	Diamond Springs.....	79	15	2 stations.....	-5	2	2.17	-1.26	Callville.....	3.54	Culpeper.....	1.10
Washington.....	31.6	+1.5	3 stations.....	62	19	Newport (a).....	-12	1	5.31	-0.23	Wynoochee Oxbow.....	28.08	Hassan.....	0.69
West Virginia.....	32.0	-0.1	New Martinsville.....	74	17	Pickens.....	-14	29	2.18	-1.75	Pickens.....	4.55	Moorefield.....	0.12
Wisconsin.....	17.8	+3.8	Racine.....	56	14	Rest Lake.....	-40	28	0.48	-0.80	Flambeau Reservoir.....	1.54	Hillsboro.....	0.08
Wyoming.....	23.6	+4.1	Fort Laramie (near).....	71	12	2 stations.....	-34	1	0.69	-0.11	Crandall Creek.....	3.36	Pinebluff.....	0.01
Alaska (December).....	16.8	-0.1	Dutch Harbor.....	52	8	Fort Yukon.....	-50	28	5.15	-0.62	Latouche.....	17.40	Fort Yukon.....	0.20
Hawaii.....	68.9	+0.9	Niuli.....	92	15	Glenwood.....	43	11	5.83	-3.42	Puu Kukui (upper).....	33.00	3 stations.....	0.00
Porto Rico.....														

<sup>1</sup> Other dates also.